

cables.doc

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This document describes how to interface your RS-232 device to the MIT RJ-11 serial standard. The MIT RJ-11 serial standard works for:

All Imachinations brand computer boards and robot controllers
The MIT 6.270 robot controller
The MIT Miniboard (versions 1.5 and 2.0)
The "Rug Warrior"
(from "Mobile Robots: Inspiration to Implementation", by
Joe Jones and Anita Flynn)

Most people will want to start with the commonly available DB-25 and DB-9 to RJ-11 converters (generally available from DigiKey or Jameco). If you buy one that fits your computer, the rest of the guide will tell you how to connect its internals to match the MIT RJ-11 standard.

WARNING WARNING WARNING

Different brand phone adapters use different color schemes!! Read the following paragraph to find out which type of phone adapter you have. (Depending on which kind you have, you may need to swap "Yellow" and "Black" in the following instructions).

Some phone adapters have 4 wires, some have 6. For those that have 6, ignore the outside two (the blue and the white). You can cut them off if you want.

Your adapter should have red and green wires in the middle, and black and yellow wires towards outside of these two. But different adapters swap the order of the red/green and black/yellow pairs!

Pick up the phone plug portion of the phone adapter you need for your machine. Orient it so that the individual colored wires are coming out towards you, and so that they are coming from the lower half. You should see that the black wire is on the left and the yellow wire is on the right. IF THIS IS NOT THE CASE (it isn't for some brands of adapters), PLEASE REVERSE BLACK AND YELLOW IN THE FOLLOWING INSTRUCTIONS.

If you have to make a phone cable, be sure to wire your phone cables like the phone company does, which means ALL WIRES ARE SWAPPED. There is typically a ridge on one of the flat faces of the cable. If you put the ridge in the same direction with respect to each plug, the wires will get swapped.

DECstation 5000 has two IBM-standard male DB-25's coming out of the back of the box (/dev/tty00 and /dev/tty01).

IBM PC or compatible may have either a male DB-25 or a male DB-9 coming out the back. (A female DB-25 is typically a parallel printer port, while a female DB-9 is typically for an old EGA-style monitor).

The easiest way to connect a Macintosh is to first buy a MiniDIN-8 to DB25 adapter. The macintosh "Modem Cable"s has a DB25 that works just

like a IBM-compatible DB25, and should be wired the same. Macintosh "Printer Cable"s have pins 2 and 3 swapped. (Often, Mac MiniDIN-8 to DB25's aren't labeled, so you won't know which you have. Either experiment, or try adding a null modem adapter to make yours work).

Here's how to wire up a phone adapter for either:

phone to female DB25 adapter (IBM and compatibles, Macintosh "Modem", DECstation 5000):

Yellow: pin 2
Black: pin 3
Red+Green: pin 7

phone to female DB9 adapter (IBM and compatibles):

Black: pin 2
Yellow: pin 3
Red+Green: pin 5

phone to female DB25 adapter (Macintosh "Printer" cable):

Black: pin 2
Yellow: pin 3
Red+Green: Pin 7

SPARCstation 1 has two female DB-25's coming out of the back of the box (/dev/ttya and /dev/ttyb). Here's how to wire up a phone adapter for it:

phone to male DB25 adapter (SPARCstation 1):

Yellow: pin 2
Black: pin 3
Red+Green: pin 7

Some SPARCstations have only one female DB-25 for serial, labeled "A/B". The above pinout will let you hook up to port "A" (/dev/ttya). Port B uses a disjoint set of pins on the same DB-25, so you'd probably want to make some sort of custom Y-adapter to get access to both ports at the same time. (This document doesn't currently contain the pins of this DB-25 used for port "B").

VAXstation 2000 has a male DB-9 coming out the back (/dev/tytys1). This is a non-standard pinout -- most DB-9 serial hardware you'll find uses the IBM-PC standard.

Here's how to wire up a phone adapter for it:

phone to female DB9 adapter (VAXstation 2000):

Yellow: pin 2
Black: pin 3
Red+Green: pin 7

VAXstation 3100 has two sort-of phone-like connectors coming out the back (arrows icon: /dev/tytys0 and printer icon: /dev/tytys1. On athena, /dev/tytys0 doesn't seem to be usable). The connector is very similar to the phone connector that are used on the robots, except that the springy tab is offset. When you find the right male connector, you'll need to make a phone cable. Because the VAX uses opposite pinout of our RJ11 standard, you'll need to make the cable with the wires STRAIGHT THROUGH; the colors should not swap sides, unlike the normal phone cables used elsewhere. But don't worry, you

can't confuse a VAX cable with a normal cable because the special VAX connector can't be plugged in to standard RJ11 jacks.

DECstation 3100 has two sort-of phone-like connectors coming out the back (arrows icon: /dev/tty00 and printer icon: /dev/tty01). See VAXstation 3100 above for how to wire up to these connectors.